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Global implications of the year 2000 date conversion problem of computers

Steps taken within the United Nations system to resolve the year 2000 date conversion problem of computers

Report of the Secretary-General

I. Introduction

1. The General Assembly, at its fifty-second session, adopted resolution 52/233 entitled "Global implications of the year 2000 problem of computers". In that resolution, the Assembly requested the Secretary-General "to report to the General Assembly at its fifty-third session on the steps taken within the United Nations system and with Member States to resolve this problem". The present report summarizes the various actions taken by the United Nations system to address this matter.

2. The year 2000 problem or "millennium bug" stems from the fact that many hardware and software systems use only two digits to identify the year. If not converted by the target date of 31 December 1999, these systems will recognize "00" not as the year 2000 but 1900. Electronic systems that are not year-2000-compliant and that involve processes based on dates will shut down, or produce meaningless or misleading results, or revert to some other date. Since all equipment configurations with embedded systems that use chips or code, and handle dates, could be affected, the problem is not limited to computer systems. As a result of this problem, compounded by the possibility of a domino effect, whole systems of the economy and critical government operations could experience significant disruptions.

3. It is becoming increasingly clear that there is a very low probability that all potentially affected systems will be identified and converted by the deadline. Virtually all efforts to remedy the millennium problem are focused on systems deemed to be mission-critical, that is, those where a malfunction could have serious consequences to the work of Governments, organizations and companies in the private sector.

II. Status of year 2000 compliance within the United Nations Secretariat

4. The Secretariat has put significant effort into ensuring that all its mission-critical systems will continue to operate correctly. Through the Information Technology Services Division (ITSD) within the Office of Central Support Services of the Secretariat, departments at Headquarters and at offices away from Headquarters have been made aware of the seriousness of the year 2000 problem, and efforts for

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its resolution have been coordinated at different levels covering all areas that would be potentially affected.

5. Information technology services in the Secretariat are decentralized. ITSD is responsible for the maintenance and operation of the wide area network and technological infrastructure and enterprise applications at Headquarters. A special project team is in charge of the development and implementation of the integrated management information system (IMIS). Departmental applications are supported by the respective departments. The local information technology infrastructure and software systems at the regional commissions and offices away from Headquarters are managed autonomously by those offices. The responsibility for year 2000 compliance follows that delineation. ITSD functions as focal point for coordinating and monitoring year 2000 activities Secretariat-wide.

A. Steps taken by Headquarters

6. As early as December 1996, a memorandum was issued by ITSD to all heads of department explaining the year 2000 phenomenon, advising them to review all departmental computer applications for year 2000 impact, and suggesting that the necessary budgetary provisions be made to ensure the availability of adequate funds to replace or reprogram non-compliant applications. As a follow-up to that memorandum, in July 1997, a survey to assess the level of compliance of software applications was issued by ITSD to all members of the provisional Information Technology Coordination Committee. Finally, in November 1997, a report was prepared by ITSD at the request of the Ad Hoc Working Group on Informatics of the Economic and Social Council, outlining the approach adopted by the Secretariat for meeting the year 2000 challenge.

7. Year 2000 activities gathered momentum again in May 1998 when the Director of ITSD requested departments and offices to examine, for compliance, all equipment not considered to be computer equipment but using embedded chips, such as fire alarms, security systems, elevators and conference support systems. At the same time, the Assistant Secretary-General of the Office of Central Support Services issued a memorandum to all heads of department and offices requesting a report on what measures had been taken by each office regarding the year 2000, what degree of compliance had been achieved so far, what strategies had been adopted to achieve full and timely compliance, and what problems could be anticipated.

8. At the request of the Secretary-General, the Board of Auditors conducted a quick study in order to assess the preparedness of United Nations Headquarters, funds and programmes, as audited by the Board, for managing the year 2000 issue. The Board surveyed the information and control systems at Headquarters and in 14 funds, programmes and other bodies. The survey was based on a questionnaire issued in connection with the above-mentioned memorandum from the Assistant Secretary-General of the Office of Central Support Services to all departments and offices and was followed up by interviews with offices in New York.

9. In order to obtain an independent review of the year 2000 preparedness of the Secretariat, a request for proposal was prepared by ITSD to carry out an overall risk assessment and recommend solutions for all affected applications and equipment. The objective of the request was to perform a year 2000 impact analysis that covers applications, databases, telecommunications systems and computer hardware and software. Although the management of departmental end-user software is decentralized and under the responsibility of the departments and offices concerned, those applications were included in the request for proposal. The contractor is further required to prepare a complete inventory of the applications. A contractor has been selected and the study is expected to be completed by the beginning of 1999. IMIS and the United Nations Joint Staff Pension Fund were excluded from the study, since it was decided to address those areas separately.

10. A summary of the current status of compliance of various elements of the technological infrastructure is given below.

1. Telephone systems

11. A contract for upgrading the software that controls the private automatic branch exchange (PABX) and related systems has been signed. The upgrade will make this service fully year-2000-compliant. Implementation is expected to be completed in 1998.

2. Message switch

12. Financial provisions have been made to replace the present facilities with a year-2000-compliant system. This project will be completed by the fourth quarter of 1999.

3. Local area network

13. The operating system of all servers and related software is being upgraded with compliant and vendor-certified versions. Decentralized servers are currently being consolidated and replaced by compliant equipment that will be located in a central computer room. The upgrade project for the network switches and routers that was initiated in

1997 has been completed. The network environment is expected to be year-2000-compliant by the beginning of 1999.

4. Personal computers

14. The 5,200 personal computers connected to the local area network of Headquarters have recently been replaced by state-of-the-art hardware and software making the desktop environment fully compliant.

5. Wide area network

15. A significant part of the United Nations network consists of facilities leased from commercial operators. Those service providers, such as the International Telecommunications Satellite Organization, AT&T and others, have still to confirm that their operations are year-2000-compliant. The United Nations part of the operation will be independently validated through the impact analysis mentioned earlier. Timely corrective action to ensure compliance of all components will be taken on the basis of the recommendations of the study.

6. Mainframe facilities

16. The mainframe systems of the Secretariat were relocated to Geneva in 1996 and are now managed by the International Computing Centre. The operating system and other commercial software run on the computers of the Centre are year-2000-compliant. The mainframe operation of the Centre has been made available to users for compliance testing of their applications. To facilitate the impact analysis, a detailed schedule for the tests is being coordinated by ITSD with the respective user departments.

7. Test environment for non-mainframe applications

17. A model environment replicating the basic hardware and software components of the United Nations network has been set up by ITSD to allow users to test departmental personal-computer and server-based applications for compliance.

8. Equipment configurations with embedded chips

18. The different departments of the Secretariat are taking actions including contacting vendors to seek formal assurance of compliance and replacing equipment as required to ensure that mission-critical services such as elevators, security and conference support systems will continue to be operational beyond the deadline.

19. The status of compliance of enterprise and departmental applications varies, depending on when the systems were first introduced. Older software is less likely to be compliant. In particular, legacy off-the-shelf software packages will have to be replaced by new products. As part of the impact analysis to be conducted by a contractor, those systems will be assessed and detailed recommendations will be made. A review of the most mission-critical systems has already been completed.

9. Integrated management information system

20. The IMIS application is year-2000-compliant by design. In the system itself, all dates are composed of eight digits. A new version of the operating system for the hardware was successfully tested at one duty station and will soon be installed on all machines with the UNIX operating system, including those used for purposes other than IMIS. The implementation of IMIS has greatly reduced the year 2000 exposure of the United Nations that would have arisen if legacy systems to support finance, procurement, personnel etc. continued to be in production beyond the year 2000. At Headquarters, releases 1, 2 and 3 are in production and release 4 (payroll) is scheduled to be implemented by mid-1999. In order to avoid risks resulting from major unexpected problems in connection with the implementation of IMIS release 4, the current payroll system is also being upgraded and applications interfacing with IMIS are being reviewed for compliance.

10. Optical disk system, e-mail, Internet and other enterprise applications

21. Plans to upgrade the software and other facilities associated with the optical disk system, e-mail, the Internet and other enterprise applications are in place and will be updated as part of their natural life cycle. Already to date, most of the enterprise applications are considered year-2000-compliant.

11. Departmental applications

22. Departmental applications are computer applications designed to meet the specific needs of processes that are unique to individual departments, such as statistical analysis, library systems and simulation models. An inventory of those applications and a summary of the current status of preparedness of individual departments of the Secretariat was presented by the Board of Auditors in a study entitled "Study report of the Board of Auditors on the preparedness of the United Nations for managing the year 2000 issue". That report, together with the independent risk assessment

that will commence shortly, will provide the basis for a detailed examination of exposure in connection with specific data calculations, which will then be ranked to determine priorities for remedying the software so as to minimize the possible impact on the work of the Organization.

B. Steps taken by offices away from Headquarters

23. Offices away from Headquarters are in different stages of preparedness. A briefing document and questionnaire was circulated to those offices early in 1998, and an update of their activities in this area is expected in response to a request from Headquarters issued in September 1998.

24. Most offices away from Headquarters depend on IMIS to replace their legacy administrative applications with a system that is year-2000-compliant. On a transitional basis, the current system will have to be maintained for retroactive processing and reporting. All duty stations with the exception of the Economic and Social Commission for Western Asia (ESCWA) have undertaken to upgrade their payroll and accounting systems to be year-2000-compliant. IMIS releases 1 and 2 have been implemented in all offices away from Headquarters. Plans for the implementation of releases 3 (accounting) and 4 (payroll) in all offices away from Headquarters are currently being formulated. Releases 3 and 4 will become operational at ESCWA during 1999. The schedule for the other duty stations will depend on local conditions.

25. The majority of the financial applications of the United Nations Office at Vienna are maintained by UNIDO. Work by UNIDO on compliance of those mainframe applications has started and is to be completed by the end of March 1999. The key components of the network of the Office are already year-2000-compliant and other hardware and software elements will be replaced by mid-1999.

26. To build awareness among staff, the Economic Commission for Europe (ECE) has published a year 2000 note on their intranet. A detailed strategy for making the ECE environment year-2000-compliant has been developed and work to remedy all hardware and software problems by the deadline is under way. ESCWA has set up a year 2000 task force, appointed focal points for all critical areas, and defined a detailed action plan that is being implemented.

27. The United Nations Office at Nairobi provides information technology services to the United Nations Environment Programme (UNEP) and the United Nations Centre for Human Settlements (UNCHS). The year 2000 issue is being addressed as part of an extensive system conversion project initiated in 1996 with the objective of integrating UNEP and UNCHS applications on a common platform.

28. Similar work is in progress at the other offices away from Headquarters. The Economic Commission for Africa is in the process of replacing most of its information technology infrastructure. The new hardware and software solutions will be fully year-2000-compliant. All old systems will be decommissioned by the end of 1999. The Economic and Social Commission for Asia and the Pacific (ESCAP) has been investigating since early 1997 the question of in-house preparedness, and has compiled an inventory list of business-critical systems. Suppliers of the building automation system, elevators, telephone systems etc. have been contacted and requested to provide formal compliance statements or recommendations for remedial action.

C. Contingency planning

29. Although mission-critical systems like IMIS are already fully year-2000-compliant, the need for contingency planning is recognized by the Secretariat. Even if the power supply and telecommunications infrastructure operated by the United Nations are fully compliant, links to external systems make them vulnerable. The possibility of a domino effect may have a negative impact on all applications and equipment configurations that have an interface with external systems. Contingency planning should identify such interdependencies.

30. Among the non-critical systems, not all may be converted in time and some compliance aspects may be overlooked. A contingency plan should make provision for crisis management, dealing with system failure and ensuring operational recovery; but most importantly, it should identify priorities and specify levels of performance degradation that the Organization can temporarily work with.

31. The paradigm of contingency planning is that in an environment that is facing a problem, a solution can be found by resorting to external resources that remain unaffected by the problem. However, since the year 2000 date conversion is a global concern, that assumption does not apply. Contingency planning for the year 2000 thus appears to be only partly a technical exercise, but mostly a management issue. The focus must be on identifying people and facilities that are essential for minimizing damage and putting a management structure in place that will effectively address problems.

32. The Secretariat is taking action along those lines. ITSD is establishing a monitoring system that will make it possible to track progress in compliance at the departmental level and at offices away from Headquarters. For the time immediately after the deadline, a crisis management structure will be created and human and technical resources will be identified that will be on alert to address potential problems.

III. Status of year 2000 preparedness of other United Nations organizations

33. Regarding issues of information technology, including the year 2000 problem, funds and specialized agencies of the United Nations system report to their respective governing bodies. The role of the Secretariat vis-à-vis those organizations is limited to disseminating information, coordination and participation in the work of inter-agency bodies such as the Information Systems Coordination Committee of the Administrative Committee on Coordination (ACC).

34. The Secretary-General, in a letter dated 30 October 1998, brought General Assembly resolution 52/233 to the attention of the members of ACC and stressed the need for greater coordination and cooperation in the area of information technology beyond the year 2000 issue. The issue was first raised by the Under-Secretary-General for Management on behalf of the Secretary-General at the high-level meeting of the Consultative Committee on Administrative Questions (CCAQ) held in February 1998. Follow-up action taken in connection with the above-mentioned resolution is expected to be on the agenda of the CCAQ meeting scheduled for early 1999.

35. Some of the programmes, funds and specialized agencies of the United Nations system are in an early stage of assessment and planning, while others are already compliant or in the process of conversion or replacement of their systems. The study by the Board of Auditors referred to above (paragraph 22) gives a detailed report of the actions taken and the current status of preparedness of the different organizations.

36. Although each organization is responsible for its own year 2000 compliance programme, the need for coordination has been recognized. The ACC Information Systems Coordination Committee has created formal mechanisms for the exchange of information and sharing of experiences on the activities undertaken. The Information Systems Coordination Committee, in cooperation with the year 2000 focal points of the International Labour Organization and the International Monetary Fund, has developed pages on the World Wide Web that will be used, within the restricted Web site of the Information Systems Coordination Committee, to collect input from organizations for further analysis and to facilitate its discussion of the year 2000 problem. Those activities are being very well supported by the individual organizations. Status reports concerning year 2000 compliance of participating organizations are available on-line and tabulated information on essential systems and services is regularly updated.

37. Further, the Information Systems Coordination Committee, in cooperation with the World Intellectual Property Organization, has developed a year 2000 compliance checklist that covers automated systems and equipment with embedded microdevices that should be checked for compliance. The Web site of the Committee also provides cross-references to other Web sites of the United Nations system, including those of programmes and funds, dealing with the year 2000 issue.

38. The Information Systems Coordination Committee, at its sixth session in October 1998, considered the development of further system-wide reporting mechanisms that have become necessary in connection with the implementation of Assembly resolution 52/233. The individual organizations will continue to report internally to their governing bodies regarding year 2000 compliance.

IV. Steps taken with Member States to resolve the year 2000 problem

39. The Ad Hoc Open-ended Working Group on Informatics of the Economic and Social Council has taken the lead in raising awareness among Member States of the nature of the year 2000 problem and actions to be taken. The report on international cooperation in the field of informatics submitted by the Secretary-General to the Council (E/1998/44) outlines the steps taken by the Working Group to build awareness among Member States and permanent observer missions of the seriousness of the problem.

40. The General Assembly, in its resolution 52/233, calls upon the Council to prepare guidelines on which Member States may be able to draw in addressing the diverse aspects of the year 2000 problem. To facilitate the work of the Council, the Working Group has drafted guidelines summarizing best practices for assessing and solving year 2000 problems and for establishing contingency plans. The guidelines were circulated as an official document of the Council (E/1998/85). In the above-mentioned letter to ACC

dated 30 October 1998, the Secretary-General drew attention to paragraph 6 of resolution 52/233, in which the Assembly requested him to ensure that the United Nations system would facilitate the dissemination of relevant information on funding possibilities to assist developing countries and countries with economies in transition to address the year 2000 problem.

41. ESCAP, at its fifty-fourth session, expressed deep concern about the year 2000 problem and urged all Governments in the region to make its resolution a high priority. ESCAP is assisting Governments in that task through its standing newsletters ("Government computerization newsletter", December 1997 and June 1998 issues) and through meetings and conferences. A year 2000 workshop held in June 1998 was organized jointly with the Statistical Institute for Asia and the Pacific and attended by 23 national statistical offices. The ESCAP Committee on Statistics will follow up that initiative at its eleventh session to be held in November 1998. Reports on ESCAP year 2000 activities and related documents are available on-line on the Internet.

42. ESCWA is coordinating a regional network of focal points in both the public and the private sector. Year 2000 awareness will be raised through a media campaign and a regional conference organized by ESCWA. Activities to create capabilities for providing advisory missions to countries in the region are under way. Similar action has been taken by other regional commissions and United Nations organizations.

43. The World Bank and other organizations in the United Nations system are considering coordinated action concerning year 2000 outreach to developing countries to ensure that all efforts within the United Nations system have optimum impact and that overlapping and duplications are minimized. In an approach similar to the one proposed in the above-mentioned guidelines (E/1998/85), the World Bank is conducting a campaign aimed first at raising awareness, then at providing guidelines on best practices to client country Governments in the design of national strategies and programmes.

44. Given the conferences, specialized publications and journals already available, as well as the proliferation of information disseminated through Internet sites of agencies, vendors and other organizations, the United Nations, with its limited resources, cannot aspire to making significant contributions beyond what is already being done by others.

V. Concluding remarks

45. In an increasingly networked world, computerized systems exchange data. The systems are often owned and managed by different entities, and in those circumstances, the failure of one to achieve year 2000 compliance may have an impact on the operations of others that are fully compliant. The recognition of a domino effect created by non-compliant data that are passed through a network has led to the understanding that the millennium bug is not limited to the technical level and individual computer systems, but is also a management and coordination problem.

46. There are a number of estimates of the global costs of resolving the year 2000 problem that differ considerably. For the United Nations, it is important to distinguish between those activities which are year-2000-specific, such as the impact assessment study and code remediation in applications, and those which result in year 2000 compliance but are a part of the normal life cycle of computer systems. Equipment is replaced on a regular basis and software is upgraded independently of the year 2000 deadline.

47. In 1997, when the budget for the biennium 1998–1999 was prepared, no special provisions were made to address the year 2000 issue. Given the importance of the year 2000, the relevant projects and activities in the context of the reform initiatives of the Secretary-General are being funded from existing resources on a priority basis. Replacement projects and upgrading originally scheduled for the biennium 2000–2001 had to be initiated earlier, to ensure system compliance by the end of the current biennium. Since the highest priority has been given to the above-mentioned activities, other projects are only progressing within the limits of the remaining resources.